

Introductory Biology Syllabus

Fletcher

Semester 1

**The following details and sequence are approximate

- **Science and the Experiment**

A look at scientific problem solving and the logic and design of different types of experiments.

Notes 1 Science and the Experiment

A Controlled Experiment: Does *Artemisia sanfriscana* require saltwater to hatch?

A Comparative Controlled Experiment: How does salinity affect seed germination?

Discovery Experiments: Tie Dye Milk

- **The Characteristics of Life**

What characteristics define life and set it apart from that which is not life?

Notes 2 The Characteristics of Life

Practice Test Notes 1 and 2

Activity: Sorting Living Organisms and Nonliving Things

Notes 3 Are Viruses Living?

- **The History of Life**

Evidence suggested that life first emerged on earth 3.8 billion years ago, and since then has undergone almost endless change, creating the living world we know today.

Notes 4 The History of Life

Test #1 Notes 1 - 3

Activity: A Timeline of the History of Life

- **Biomolecules and Cells**

All life is based upon the cell, the smallest living unit. Cells are made of special molecules called proteins, nucleic acids, carbohydrates and lipids.

Notes 5 Biomolecules

Activity: Building Molecular Models

Controlled Experiment: An Investigation of Enzyme Activity

Notes 6 Cells

Investigating Cells with the Compound Light Microscope

Notes 7 The Cell Membrane

Activity: Investigating Osmosis

- **The Diversity of Life and the Six Kingdoms**

To better understand life, science organizes life into different categories in a complex classification system.

Notes 8 The Six Kingdoms of Life

Test #2 Notes 4 - 6

Notes 9 Biological Classification

Activity: Classifying Weirdarians

- **The Human Animal**

Humans are complex animals with multiple organ systems.

Notes 10 Human Organ Systems

Presentations: Human Body Systems

Test #3 Notes 7 - 9

- **Careers in Biology**

A background in biology can lead to any number of desirable careers.

Notes 11 Careers in Biology

Semester 2

- **Life and Energy**

Photosynthesis and cellular respiration are involved in capturing energy and making it usable.

Notes 12 Energy and Photosynthesis

Controlled Experiment: Observing Photosynthesis

Notes 13 Cellular Respiration and Related Processes

Controlled Experiment: Observing Cellular Respiration and Fermentation

- **Cellular and Organismal Reproduction**

Cells reproduce using mitotic or meiotic cell cycles. These cycles are related to organismal reproduction, which occurs either sexually or asexually.

Notes 14 The Cell Cycle and Mitosis

Activity: Modeling the Mitotic Cell Cycle

Activity: Observing Mitosis with the Microscope

Notes 15 Meiosis and Sexual Reproduction

Test #1 Notes 12 – 15

- **Genetics**

Genetics is the study of how DNA directs growth and development of the cell and the organism.

Genes, or the parts of our DNA that hold information, work in complex ways.

Notes 16 Genetics and DNA

Activity: Extracting DNA from Cells

Notes 17 Protein Synthesis

Activity: Transforming Bacteria

Notes 18 How Genes Lead to Traits Part 1

Activity: Gel Electrophoresis

Notes 19 How Genes Lead to Traits Part 2

Test #2 Notes 16 - 19

Activity: Making Dragons

Notes 20 Mutation and Genetic Disease

- **Life Changes**

Over 3.8 billion years life has changed (evolution), driven by changing DNA.

Notes 21 Evidence That Life Is Related and That Life Changes

Activity: Relative Fossil Dating

Notes 22 Changing Life and Natural Selection

Activity: Superbug

- **Ecology**

Living things interact with other living things and nonliving components of their environment.

Notes 23 An Introduction to Ecology

Test #3 Notes 20 - 23

Activity: Biomes

Notes 24 The World Today and In the Future

Final Exam - May 18 and 19

Notes 12 - 24

Biology is fascinating and the skills we will practice and improve upon this year may very well be important in your future. Together we are going to make this a productive, profitable year of positive growth.